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Significant inflows of ground waters were encountered in the 10 Left area of the mine (Drawing PHC A-2). This resulted in Skyline Mine drilling two mine dewatering wells in James Canyon. The first well, JC-1, was pumped at a rate of approximately 2100 gpm from November 2001 to October 2002. At that time, a new pump and motor was placed in the well and produced approximately 4200 gpm. JC-2 well was only capable of producing approximately 300 gpm and was shut in shortly after completion. The details of the two wells are discussed in detail in the July 2002 Addendum to the PHC. A third well, JC-3, was drilled and completed by PacifiCorp in March-April of 2003 to discharge water from the 10 Left area of the mine to Electric Lake. Details of the well are included in Section 3.2-11(a) of this M&RP.

In most cases it appears the faults within the Blackhawk Formation in the permit area are not allowing significant vertical movement of ground water. The most logical cause of this apparently low permeability along most of the faults is clay content. However, as discussed in Section 2.2, the north-south trending faults in the Mine 2 area appear to be the result of extensional forces acting upon the formations and resulting in pathways for the water to move upward out of the Star Point and into Mine 2. The formations in Mine 3 and North Lease areas are under compression and the east-west trending faults in the area do not create pathways for the upward migration of ground water. Therefore, as mining proceeds to the North Lease area, it is likely water encountered in the mine will come mainly from the draining of sandstone channels in the mine roof, as was the case in the previously mined portions of Mine 3.

A detailed discussion of the geological characteristics of the project area is presented in the preceding section (Section 2.2).

2.3.2 Characteristics of Seeps and Springs

As a result of field investigations during 1978, 174 seeps and springs were located on and immediately adjacent to the Skyline project area

December through February since they are adjacent to a maintained road and the water discharged from the mine normally keeps the stream from freezing over.

Water quality samples are collected from the 23 selected springs in the project area. The samples are comprehensively analyzed each year for the parameters listed in Tables 2.3.7-1 and Table 2.3.7-2. All water samples collected for use in this permit have been collected and analyzed according to methods in either the "Standard Methods for the Examination of Water and Wastewater" or the 40 CFR parts 136 and 434. A listing identifying the station types is shown on Table 2.3.7-3.

In addition to the collection of the outlined water quality data, water level data has been collected from each of the wells (if functional) as scheduled on Tables 2.3.7-1, 2.3.7-2 and 2.3.7-3, and noted on Plate 2.3.6-1. Water quality samples will be collected from the Waste Rock Disposal Site Well 92-91-03 in accordance with the schedule and parameter list shown on table 2.3.7-5. Summary information on these observation wells is found on Table 2.3.7-4. Three wells, 79-14-2B and 79-22-2-1 and 79-22-2-2 have experienced casing failures, and are currently nonfunctional. There are no plans to replace these wells.

The amount of water discharged from each mine on each monitoring occasion will also be monitored at the mine mouth through the use of a totalizing flow meter or similar device. Significant changes in the source of water in the mine will be noted during the period of operation. Underground water pumped from each mine will be monitored for water quality. Mine #1 discharge is sampled at Station CS-14. Mine #3 discharge is sampled at Station CS-12, and Mine #2 water is discharged at JC-3. Should the concentrations result in a ~~sedimentation pond~~ discharge which exceeds the UPDES discharge permit limitations or indicates potential disturbance to the hydrologic balance, an attempt will be

Samples obtained at the MC-sites will be monitored for total flow, TDS, TSS, and total phosphorous. The results of these analyses will be reported with the other mine water quality monitoring reports.

Sites MD-1 ~~and~~, JC-1, and JC-3 were also added to the monitoring site list. MD-1 is a composite sample of the all water discharged from Skyline Mine to Eccles Creek. JC-1 and JC-3 are ~~is a composite~~ samples of the water discharged from the two James Canyon ground and mine dewatering ~~water discharge~~ wells. ~~Both~~ Each of these sites are monitored for total flow and the results are reported to the Division on a monthly basis. Quarterly, these sites are also monitored for TSS, TDS, and total phosphorous. Since JC-3 is a UPDES site, it is monitored each month for flow, TSS, TDS, oil and grease, and total iron. The UPDES sampling results are forwarded to the Division monthly.

Spring monitoring sites WQ1-39, WQ3-6, WQ3-26, WQ3-41 WQ3-43, and WQ4-12 were added to the permit. Surface water sites CS-19, CS-20,and CS-21 were added as were wells 91-26-1 and 91-35-1. All of these sites are in the North Lease area. Location of these samples sites are illustrated on Drawing 2.3.6-1.

Skyline Mine has also obtained numerous water samples from within the mine for age-dating purposes. Samples have been analyzed for both stable and unstable isotopes; the majority being analyzed for tritium and carbon 14 content. The analyses results of these samples is discussed in detail in the July 2002 Addendum to the PHC. The results of repeated tritium sampling and analysis in a few location in the mine, specifically those in the 9 and 10 Left panel areas that began in August 2001, suggest that the majority of the water is not younger than 50 years. Only a few carbon 14 samples have been obtained from these sites but the results indicate the waters are several thousand years old. The sampling sites in the 9 and 10 Left panel areas became inaccessible as that portion of the mine was sealed in September 2002. Remaining significant inflow sites, particularly the east submains site (previously identified as the west submains)and a few of the sites in the 11 and 12 left panel areas, will be accessible through June of 2004. The mine will obtain carbon 14 and tritium samples from these sites on a

(Surface and Ground Water Stations)
-Low Summer Flow-
(August - September)

Annual - Water Quality Stations CS-1, CS-2, CS-3, CS-4, CS-6, CS-7 (F-5), CS-8, CS-9, CS-10, CS-11, CS-12, CS-13, CS-14, CS-16, CS-17, CS-18, CS-19, CS-20, CS-21, F-9*, F-10, UP&L-10, VC-6, VC-9, VC10, S10-1, S12-1, S13-2, S13-7, S14-4, S15-3, S17-2, S22-5, S22-11, S23-4, S24-12, S26-13, S34-12, S35-8, S36-12, WRDS #1, WRDS #2, WRDS #3,WRDS #4, 2-413, 3-290, MC-1*, MC-2*, MC-3*, MC-4*, MC-5*, MC-6*, JC1*, JC-3*, MD-1*,WQ1-39, WQ3-6, WQ3-26, WQ3-41 WQ3-43, WQ4-12.

Field Measurements	Laboratory Measurements	
Flow	Acidity	Lead, Total and Dissolved
Dissolved Oxygen	Alkalinity	Magnesium
pH	Bicarbonate	Manganese, Total and
Specific Conductance	Ammonia	Nitrate
Temperature, Air	Barium, Total and	Phosphate
Temperature, Water	Boron, Total and	Potasium
Turbidity	Calcium	Sodium
	Chloride	Sulfate
	Copper, Total and	Suspended Solids
	Fluoride	Total Dissolved Solids
	Iron, Total and	

Note: Station VC-9 will use calculated flow from Station CS-6 and CS-13. *F-9 to be monitored for field parameters only. Flows at F-9 and F-10 will be monitored monthly when accessible. MC-1, -2, -3, -4, -5,-6, JC-1, JC-3 and MD-1 samples to be analyzed for flow, TDS, TSS, and total phosphorous only. JC-1 and MD-1 monitored for flows and reported monthly. CS-2 and VC-9 to be also analyzed for total phosphorous.

ADDITIONS TO THE COMPREHENSIVE SCHEDULE FOR ECCLES CANYON STREAM STATIONS AND WASTE ROCK DISPOSAL SITE

Includes stations CS-1, CS-2, CS-3, CS-4, CS-6, CS-9, CS-11, CS-12, CS-13, CS-14, VC-6, VC-9, VC-10, WRDS #1, WRDS #2, WRDS #3, AND WRDS #4.

Cyanide	Phenols
	Total Organic Carbon

WELLS - WATER LEVELS ONLY

Well locations: W79-10-1A, W79-10-1B, W79-14-2A, , W79-26-1, W79-35-1A, W79-35-1B, W2-1 (98-2-1), W20-4-1, W20-4-2, W99-4-1, W99-21-1, W99-28-1, W20-28-1, 91-26-1, and 91-35-1.

TABLE 2.3.7-2

ABBREVIATED WATER QUALITY ANALYTICAL SCHEDULE
(SURFACE AND GROUNDWATER STATIONS)
-HIGH SPRING (APRIL - JUNE) AND
LATE FALL (OCTOBER - NOVEMBER) FLOWS-

SEASONAL - WATER QUALITY STATIONS CS-1, CS-2*, CS-3, CS-4, CS-6, CS-7 (F-5), CS-8, CS-9, CS-10, CS-11, CS-12, CS-13, CS-14,CS-16, CS-17, CS-18, CS-19, CS-20, CS-21, F-9*, F-10, UPL-10, VC-6, VC-9*, VC-10, S10-1, S12-1, S13-2, S13-7, S14-4, S15-3, S17-2, S22-5, S22-11, S23-4, S24-12, S26-13, S34-12, S35-8, S36-12, WRDS #1, WRDS #2, WRDS #3 WRDS #4,2-413, 3-290, MC-1*, MC-2*, MC-3*, MC-4*, MC-5*, MC-6*, JC-1*, JC-3*, MD-1*, WQ1-39, WQ3-6, WQ3-26, WQ3-41 WQ3-43, WQ4-12.

FIELD MEASUREMENTS	LABORATORY MEASUREMENTS	
Flow	Ammonia	Nitrate
pH	Bicarbonate	Phosphate
Specific Conductance	Calcium	Potassium
Temperature, Air	Chloride	Sodium
Temperature, Water	Iron, Total	Sulfate
Turbidity	Magnesium	Suspended Solids
	Manganese, Total	Total Dissolved Solids

NOTES: Station VC-9 will use calculated flow data from Stations CS-6 and CS-13. Dissolved oxygen will be measured at Stations CS-2, CS-6, VC-6 and VC-9.

*F-9 to be monitored for field parameters only. Flows at F-9 & F-10 will be monitored monthly when accessible. MC-1, -2, -3, -4, -5, -6, JC-1, JC-3, and MD-1 samples to be analyzed for flow, TDS, TSS, and total phosphorous only. JC-1 and MD-1 monitored for flows and reported monthly. CS-2 and VC-9 to be also analyzed for total phosphorous.

SEASONAL ADDITIONS TO THE ABBREVIATED SCHEDULE
FOR ECCLES CANYON STREAM STATIONS
AND WASTE ROCK DISPOSAL SITE STATIONS

Includes stations CS-1, CS-2, CS-3, CS-4, CS-6, CS-9, CS-11, CS-12, CS-13, CS-14, VC-6, VC-9, VC-10, WRDS #1, WRDS #2, WRDS #3 and WRDS #4.

Phenols
Oil & Grease

WELLS - WATER LEVEL ONLY

Well locations: W79-10-1A, W79-10-1B, W79-14-2A, , W79-26-1, W79-35-1A, W79-35-1B, W2-1 (98-2-1), W20-4-1, W20-4-2, W99-4-1, W99-21-1, W99-28-1, W20-28-1, 91-26-1, and 91-35-1.

In addition to the high spring and late fall monitorings taken at all stations, winter season monitoring (Dec. - Feb.) for the above abbreviated schedule, including seasonal additions, will be taken at the following stations as accessibility permits: CS-2, CS-3, CS-6, CS-9, CS-11, CS-12, CS-13, CS-14, VC-6, VC-9, VC-10, MC-1, MC-2, MC-3, MC-4, MC-5, and MC-6. Station CS-15 will be monitored for flow only each Spring, Summer and Fall beginning Fall 1988.

TABLE 2.3.7-3
MONITORING STATION IDENTIFICATION

ECCLES CANYON/MUD CREEK DRAINAGES

STREAM STATIONS - 18 Stations

CS-1	CS-2	CS-3	CS-4	CS-6	CS-9	
CS-11	CS-15	VC-6	VC-9	VC-10	MC-1	MC-2
MC-3	MC-4	MC-5	MC-6	CS-19	CS-20	CS-21

MINE DISCHARGE STATIONS - 4 Stations

CS-12 (Mine #3) CS-14 (Mine #1) MD-1 (Composite CS-12 & CS-14)
JC-3 (Mine #2 James Canyon)

FRENCH DRAIN STATIONS - 1 Station

CS-13

HUNTINGTON CANYON

STREAM STATIONS - 14 Stations

CS-7 (F-5)	CS-8	CS-1	CS-16	CS-17
CS-18	UPL-3*	UPL-10	F-9	F-10

*Discontinued Spring, 1989

WASTEROCK DISPOSAL SITE

STREAM STATIONS - 4 Stations

WRDS #1 WRDS #2 WRDS #3 WRDS #4

GROUNDWATER STATIONS

SPRINGS - 24 Stations

S10-1	S12-1	S13-2	S13-7	S14-4	S15-3	S17-2
S22-5	S22-11	S23-4	S24-12	S26-13	S34-12	S35-8
S36-12	2-413	3-290	WQ1-39	WQ3-6	WQ3-26	WQ3-41
WQ3-43	WQ4-12					

WELLS (MONITORING) - 18 Well Stations

W79-101A	W79-10-1B	W79-14-2A	W79-26-1	W79-35-1A
W79-35-1B	92-91-03	W2-1(98-2-1)	W20-4-1	W20-4-2
W99-4-1	W99-21-1	W99-28-1	W20- 28-1	JC-1
JC-3	91-26-1	91-35-1		

WELLS, CULINARY -Referenced but not monitored

W13-1 W13-2 W17-1 W17-3 W24-1

NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES)

001 Portal Area 002 Loadout Area 003 Waste Rock Area JC-3 James Canyon

Significant inflows of ground waters were encountered in the 10 Left area of the mine (Drawing PHC A-2). This resulted in Skyline Mine drilling two mine dewatering wells in James Canyon. The first well, JC-1, was pumped at a rate of approximately 2100 gpm from November 2001 to October 2002. At that time, a new pump and motor was placed in the well and produced approximately 4200 gpm. JC-2 well was only capable of producing approximately 300 gpm and was shut in shortly after completion. The details of the two wells are discussed in detail in the July 2002 Addendum to the PHC. A third well, JC-3, was drilled and completed by PacifiCorp in March-April of 2003 to discharge water from the 10 Left area of the mine to Electric Lake. Details of the well are included in Section 3.2-11(a) of this M&RP.

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A detailed discussion of the geological characteristics of the project area is presented in the preceding section (Section 2.2).

2.3.2 Characteristics of Seeps and Springs

As a result of field investigations during 1978, 174 seeps and springs were located on and immediately adjacent to the Skyline project area

Late fall samples are obtained in October through November. These time periods were selected because the sites are usually inaccessible until late June and after November due to snow depth and frozen water courses. Several sites on Eccles Creek are monitored in December through February since they are adjacent to a maintained road and the water discharged from the mine normally keeps the stream from freezing over.

Water quality samples are collected from the 23 selected springs in the project area. The samples are comprehensively analyzed each year for the parameters listed in Tables 2.3.7-1 and Table 2.3.7-2. All water samples collected for use in this permit have been collected and analyzed according to methods in either the "Standard Methods for the Examination of Water and Wastewater" or the 40 CFR parts 136 and 434. A listing identifying the station types is shown on Table 2.3.7-3.

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monitoring at the selected sites. The initial field work for this project was completed in August 2002 but the interim report is not yet available. Skyline will submit this first and subsequent first progress reports for this project with its annual reports.

Samples obtained at the MC-sites will be monitored for total flow, TDS, TSS, and total phosphorous. The results of these analyses will be reported with the other mine water quality monitoring reports.

Sites MD-1, JC-1, and JC-3 were also added to the monitoring site list. MD-1 is a composite sample of the all water discharged from Skyline Mine to Eccles Creek. JC-1 and JC-3 are samples of the water discharged from the two James Canyon ground and mine dewatering wells. Each of these sites are monitored for total flow and the results are reported to the Division on a monthly basis. Quarterly, these sites are also monitored for TSS, TDS, and total phosphorous. Since JC-3 is a UPDES site, it is monitored each month for flow, TSS, TDS, oil and grease, and total iron. The UPDES sampling results are forwarded to the Division monthly.

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Skyline Mine has also obtained numerous water samples from within the mine for age-dating purposes. Samples have been analyzed for both stable and unstable isotopes; the majority being analyzed for tritium and carbon 14 content. The analyses results of these samples is discussed in detail in the July 2002 Addendum to the PHC. The results of repeated tritium sampling and analysis in a few location in the mine, specifically those in the 9 and 10 Left panel areas that began in August 2001, suggest that the majority of

Table 2.3.7-1

Comprehensive Water Quality Analytical Schedule
(Surface and Ground Water Stations)
-Low Summer Flow-
(August - September)

Annual - Water Quality Stations CS-1, CS-2, CS-3, CS-4, CS-6, CS-7 (F-5), CS-8, CS-9, CS-10, CS-11, CS-12, CS-13, CS-14, CS-16, CS-17, CS-18, CS-19, CS-20, CS-21, F-9*, F-10, UP&L-10, VC-6, VC-9, VC10, S10-1, S12-1, S13-2, S13-7, S14-4, S15-3, S17-2, S22-5, S22-11, S23-4, S24-12, S26-13, S34-12, S35-8, S36-12, WRDS #1, WRDS #2, WRDS #3,WRDS #4, 2-413, 3-290, MC-1*, MC-2*, MC-3*, MC-4*, MC-5*, MC-6*, JC1*, JC-3*, MD-1*,WQ1-39, WQ3-6, WQ3-26, WQ3-41 WQ3-43, WQ4-12.

Field Measurements	Laboratory Measurements	
Flow	Acidity	Lead, Total and Dissolved
Dissolved Oxygen	Alkalinity	Magnesium
pH	Bicarbonate	Manganese, Total and
Specific Conductance	Ammonia	Nitrate
Temperature, Air	Barium, Total and	Phosphate
Temperature, Water	Boron, Total and	Potasium
Turbidity	Calcium	Sodium
	Chloride	Sulfate
	Copper, Total and	Suspended Solids
	Fluoride	Total Dissolved Solids
	Iron, Total and	

Note: Station VC-9 will use calculated flow from Station CS-6 and CS-13. *F-9 to be monitored for field parameters only. Flows at F-9 and F-10 will be monitored monthly when accessible. MC-1, -2, -3, -4, -5,-6, JC-1, JC-3 and MD-1 samples to be analyzed for flow, TDS, TSS, and total phosphorous only. JC-1 and MD-1 monitored for flows and reported monthly. CS-2 and VC-9 to be also analyzed for total phosphorous.

ADDITIONS TO THE COMPREHENSIVE SCHEDULE FOR
ECCLES CANYON STREAM STATIONS
AND WASTE ROCK DISPOSAL SITE

Includes stations CS-1, CS-2, CS-3, CS-4, CS-6, CS-9, CS-11, CS-12, CS-13, CS-14, VC-6, VC-9, VC-10, WRDS #1, WRDS #2, WRDS #3, AND WRDS #4.

Cyanide	Phenols
	Total Organic Carbon

WELLS - WATER LEVELS ONLY

Well locations: W79-10-1A, W79-10-1B, W79-14-2A, , W79-26-1, W79-35-1A, W79-35-1B, W2-1 (98-2-1), W20-4-1, W20-4-2, W99-4-1, W99-21-1, W99-28-1, W20-28-1, 91-26-1, and 91-35-1.

TABLE 2.3.7-2

ABBREVIATED WATER QUALITY ANALYTICAL SCHEDULE
(SURFACE AND GROUNDWATER STATIONS)
-HIGH SPRING (APRIL - JUNE) AND
LATE FALL (OCTOBER - NOVEMBER) FLOWS-

SEASONAL - WATER QUALITY STATIONS CS-1, CS-2*, CS-3, CS-4, CS-6, CS-7 (F-5), CS-8, CS-9, CS-10, CS-11, CS-12, CS-13, CS-14,CS-16, CS-17, CS-18, CS-19, CS-20, CS-21, F-9*, F-10, UPL-10, VC-6, VC-9*, VC-10, S10-1, S12-1, S13-2, S13-7, S14-4, S15-3, S17-2, S22-5, S22-11, S23-4, S24-12, S26-13, S34-12, S35-8, S36-12, WRDS #1, WRDS #2, WRDS #3 WRDS #4,2-413, 3-290, MC-1*, MC-2*, MC-3*, MC-4*, MC-5*, MC-6*, JC-1*, JC-3*, MD-1*, WQ1-39, WQ3-6, WQ3-26, WQ3-41 WQ3-43, WQ4-12.

FIELD MEASUREMENTS	LABORATORY MEASUREMENTS	
Flow	Ammonia	Nitrate
pH	Bicarbonate	Phosphate
Specific Conductance	Calcium	Potassium
Temperature, Air	Chloride	Sodium
Temperature, Water	Iron, Total	Sulfate
Turbidity	Magnesium	Suspended Solids
	Manganese, Total	Total Dissolved Solids

NOTES: Station VC-9 will use calculated flow data from Stations CS-6 and CS-13. Dissolved oxygen will be measured at Stations CS-2, CS-6, VC-6 and VC-9.

*F-9 to be monitored for field parameters only. Flows at F-9 & F-10 will be monitored monthly when accessible. MC-1, -2, -3, -4, -5, -6, JC-1, JC-3, and MD-1 samples to be analyzed for flow, TDS, TSS, and total phosphorous only. JC-1 and MD-1 monitored for flows and reported monthly. CS-2 and VC-9 to be also analyzed for total phosphorous.

SEASONAL ADDITIONS TO THE ABBREVIATED SCHEDULE
FOR ECCLES CANYON STREAM STATIONS
AND WASTE ROCK DISPOSAL SITE STATIONS

Includes stations CS-1, CS-2, CS-3, CS-4, CS-6, CS-9, CS-11, CS-12, CS-13, CS-14, VC-6, VC-9, VC-10, WRDS #1, WRDS #2, WRDS #3 and WRDS #4.

Phenols
Oil & Grease

WELLS - WATER LEVEL ONLY

Well locations: W79-10-1A, W79-10-1B, W79-14-2A, , W79-26-1, W79-35-1A, W79-35-1B, W2-1 (98-2-1), W20-4-1, W20-4-2, W99-4-1, W99-21-1, W99-28-1, W20-28-1, 91-26-1, and 91-35-1.

In addition to the high spring and late fall monitorings taken at all stations, winter season monitoring (Dec. - Feb.) for the above abbreviated schedule, including seasonal additions, will be taken at the following stations as accessibility permits: CS-2, CS-3, CS-6, CS-9, CS-11, CS-12, CS-13, CS-14, VC-6, VC-9, VC-10, MC-1, MC-2, MC-3, MC-4, MC-5, and MC-6. Station CS-15 will be monitored for flow only each Spring, Summer and Fall beginning Fall 1988.

TABLE 2.3.7-3
MONITORING STATION IDENTIFICATION

ECCLES CANYON/MUD CREEK DRAINAGES

STREAM STATIONS - 18 Stations

CS-1	CS-2	CS-3	CS-4	CS-6	CS-9	
CS-11	CS-15	VC-6	VC-9	VC-10	MC-1	MC-2
MC-3	MC-4	MC-5	MC-6	CS-19	CS-20	CS-21

MINE DISCHARGE STATIONS - 4 Stations

CS-12 (Mine #3) CS-14 (Mine #1) MD-1 (Composite CS-12 & CS-14)
JC-3 (Mine #2 James Canyon)

FRENCH DRAIN STATIONS - 1 Station

CS-13

HUNTINGTON CANYON

STREAM STATIONS - 14 Stations

CS-7 (F-5)	CS-8	CS-1	CS-16	CS-17
CS-18	UPL-3*	UPL-10	F-9	F-10

*Discontinued Spring, 1989

WASTEROCK DISPOSAL SITE

STREAM STATIONS - 4 Stations

WRDS #1 WRDS #2 WRDS #3 WRDS #4

GROUNDWATER STATIONS

SPRINGS - 24 Stations

S10-1	S12-1	S13-2	S13-7	S14-4	S15-3	S17-2
S22-5	S22-11	S23-4	S24-12	S26-13	S34-12	S35-8
S36-12	2-413	3-290	WQ1-39	WQ3-6	WQ3-26	WQ3-41
WQ3-43	WQ4-12					

WELLS (MONITORING) - 18 Well Stations

W79-101A	W79-10-1B	W79-14-2A	W79-26-1	W79-35-1A
W79-35-1B	92-91-03	W2-1(98-2-1)	W20-4-1	W20-4-2
W99-4-1	W99-21-1	W99-28-1	W20- 28-1	JC-1
JC-3	91-26-1	91-35-1		

WELLS, CULINARY -Referenced but not monitored

W13-1 W13-2 W17-1 W17-3 W24-1

NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES)

001 Portal Area 002 Loadout Area 003 Waste Rock Area JC-3 James Canyon

the area under final reclamation begins, except for periodic inspections. The culvert trash rack and portal highwall will be inspected at a minimum of three times a year: (1) early spring; (2) mid-summer at the beginning of the thunderstorm season, and (3) late fall before freeze-up.

3.2.11(a) James Canyon Area

The Upper O'Connor B seam has a large inflow of ground water into the active mining operations. To reduce the amount of inflow, two de-watering wells were drilled in James Canyon (see map 3.4-1 James Canyon). Access to the water well site is via an exiting road in James Canyon. The road had been water barred and reseeded in the 1970's. Approximately, 4,400 feet of the James Canyon was reopened to reach the drill pad location. As construction started the topsoil from the road was pushed aside and used a berm. A 18-inch culvert was installed in a side drainage to James Canyon. The water bars were left in place and silt fences were installed at the outflow of each bar for sediment control.

A track hoe was used to remove the topsoil from the drill pad and stored at the head of James Canyon. The topsoil was encircled by silt fence for sediment control and marked with a sign. The subsoils were used as fill to create the drill pad. The drill pad is approximately 100 feet wide and 200 feet long or about 0.46 acres. A ditch was constructed above the drill pad to divert water from the undisturbed area. The runoff calculations and ditch design are included in Volume 5, Section 22 James Canyon. An 18-inch culvert was placed in the road just east of the drill pad to allow drainage from the undisturbed area to enter James Canyon Creek. The culvert design calculation are included in Volume 5, Section 22 James Canyon. A sediment pond was dug on the west end of the drill pad to treat runoff from the disturbed area. The sediment pond is designed for total containment and the design calculations are in Volume 5, Section 22 James Canyon. Silt fence was placed at the toe of the out-slope for sediment control.

Two water wells were drilled in the fall of 2001. The first hole, JC-1, was bored to a 19-inch diameter and cased with 14-inch diameter steel pipe and wire-wrap screen. The hole was drilled at an approximate angle of 22 degrees from vertical, dips to the east, and penetrates the water producing fault below the 10 Left panel area. The total length of the drill hole is 1,030 feet. The second hole, JC-2, was drilled vertically, has a 29-inch diameter borehole, and was cased with 20-inch diameter steel pipe and wire-wrap screen. The hole was drilled into the sandstone below the coal seam and bottoms out at 1,010 feet. Electric well pumps were installed in each well and were initially operated using a diesel generator. The diesel generator was replaced by underground

power cables in November 2001 that run from a PacifiCorp power line located near the head of James Canyon to the well site. An 8-inch wide three foot deep trench was dug on the outer edge of the James Canyon road for routing power cables to the drill pad. Three power cables and one communication cable were placed in the trench. The cables are rated for 12,400 volts. A transformer is used to reduce the voltage to 4,160 volts and switch gear are used to turn the pumps on and off.

A 16-inch diameter HDPE pipe was buried from the drill pad to Electric Lake. The pipeline was routed along the old James Canyon road to the lake. Once the pipeline was buried, the road surface was deep gouged, the water bars were reestablished, silt fences installed at the outflow of the water bars for sediment control, and the disturbed area was reseeded.

A third well, JC-3, will be drilled at the James Canyon well pad site in March-April 2003. This well will be drilled and completed within the 10 Left area of Skyline mine. This area of the mine was sealed in October 2002 after mining of the 9 Left panel was complete. The purpose of the well is to remove water from the mine and discharge it to Electric Lake. It is likely the pumping rate will not exceed 4700 gpm from this well. PacifiCorp will obtain a UPDES permit and operate the well to discharge mine water to the lake. While Skyline Mine remains the permittee on this well, PacifiCorp will be the operator of JC-3. Water from the JC-3 well will be pumped to the lake through the existing buried 16-inch HDPE pipe. A transformer and switching gear separate from the JC-1 and JC-2 equipment will be used to operate this well. No additional disturbance outside the existing James Canyon well pad disturbed area is anticipated as a result of drilling and completing JC-3. Plate 3.4-1 illustrates the location of the JC-3 well and related power equipment.

The JC-3 well will be drilled at an angle of 13.61° from vertical and in an eastward direction from the well pad. The depth of the hole will be approximately 1090 to 1100 feet deep vertically with an angle length of approximately 1120 to 1130 feet. The boring will drill through the mine workings and terminate approximately 350 feet below the workings. The details of the well construction and surface piping are included as Drawing 3.2-11-A . The detailed plans were prepared by Hansen, Allen, and Luce for PacifiCorp. Please note the "Future Fence" as illustrated on sheet C-1 of Drawing 3.2-11-A would only be built if the wells were transferred to Pacific Corp and are not part of this M&RP.

Skyline Mine will reclaim the entire James Canyon well site at final mine reclamation unless other arrangements are made and agreed upon by the Division, the Manti-LaSal National Forest, and PacifiCorp. Skyline Mine has included the costs of reclaiming the three dewatering wells in James

the area under final reclamation begins, except for periodic inspections. The culvert trash rack and portal highwall will be inspected at a minimum of three times a year: (1) early spring; (2) mid-summer at the beginning of the thunderstorm season, and (3) late fall before freeze-up.

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that run from a PacifiCorp power line located near the head of James Canyon to the well site. An 8-inch wide three foot deep trench was dug on the outer edge of the James Canyon road for routing power cables to the drill pad. Three power cables and one communication cable were placed in the trench. The cables are rated for 12,400 volts. A transformer is used to reduce the voltage to 4,160 volts and switch gear are used to turn the pumps on and off.

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3.2.12 Areas Not Reporting to Sedimentation Ponds, Exempt Areas and Special Exempt Areas

There are 41 areas that do not report to any sedimentation pond. There are also small areas in front of portals 2, 3 & 4 of both Mine #1 and Mine #3 and South Fork breakout which drain back into the mines. This water enters the normal mine drainage system and is pumped back into the sedimentation pond.

On all areas not reporting to a sediment pond, sediment control measures such as strawbales, silt fences, straw dikes, excelsior mats, etc. will be installed and maintained until there is adequate vegetative cover to properly filter any surface runoff. See Vol. 5, Sec. 20 for designs for all ASCA treatment. When this occurs, the alternate control measures will be removed and not maintained if it can be demonstrated that they are not needed and approved by the Division.

Maintenance is done on all structures (straw bales, silt fences and straw dikes) a minimum of three times a year. It is done first in the spring as soon as they are accessible after snow melt, second during mid-summer, and third in late fall just before snow fall. All areas are observed for effectiveness almost daily by trained mine personnel and if deficiencies are seen, corrective action is taken.

Area 1. The Water Tank area is shown on Map No. 4.4.2-1F. It contains .19 acres and is classified as an "Exempt Area". This area has been reseeded and has a well established cover of grass, forbs and trees. The permittee has run a SedCAD program to demonstrate the runoff so that this area can be classified as an exempt area. (See Vol. 5 Sec. 21).

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BONDING CALCULATION
SKYLINE MINE - ACT/007/005
REVISED: 31-Mar-03
PREPARED BY: GARY TAYLOR

BOND SUMMARY

I. SUBTOTAL DEMOLITION AND REMOVAL	$1,989,461		
II. SUBTOTAL BACKFILLING AND GRADING	$464,826		
III. SUBTOTAL TOPSOIL PREPARATION AND DISTRIBUTION	$188,642		
IV. SUBTOTAL STREAM CHANNEL RECLAMATION	$600,855		
V. SUBTOTAL REVEGETATION	$294,486		
VI. SUBTOTAL INTERIM SEDIMENT CONTROL FACILITIES	$69,631		
SUBTOTAL OF RECLAMATION COSTS	$3,607,902		
MOBILIZATION AND DEMOBILIZATION - 10%	$360,790	10.00%	
CONTINGENCY - 5%	$180,395	5.00%	
ENGINEERING REDESIGN FEE - 2.5%	$90,198	2.50%	
MAIN OFFICE EXPENCE-6.8%	$245,337	6.80%	
PROJECT MANAGEMENT FEE - 2.5%	$90,198	2.50%	
TOTAL INDIRECT COSTS	$966,918	26.80%	
GRAND TOTAL BOND AMOUNT	$4,574,820		
INFLATION RATE			0.0282
YEARS			5
INFLATION AMOUNT	682,471		
TOTAL BOND AMOUNT	5,257,291		
TOTAL BOND AMOUNT ROUNDED TO NEAREST $1,000 IN 2007 DOLLARS	5,257,000		

Note: THE HISTORICAL NUMBERS AND EQUIPMENT PRODUCTIVITY CALCULATIONS ARE FOUND IN SECTION 17, VOLUME 5.

UNIT COST REFERENCE FOR BOND ESTIMATE:

1. LABOR AND SUPERVISION COSTS (MEANS CONSTRUCTION COST DATA, 58 TH EDITION)

TRADE	RATE/HR
FOREMAN	$42.64
EQUIPMENT OPERATOR	$39.14
TRUCK DRIVER	$28.84
LABORER	$27.54
CRANE OPERATOR	$40.34

2. EQUIPMENT COSTS INCLUDING OPERATOR (BLUE BOOK AND MEANS)

EQUIPMENT	MONTHLY RATE *	ADJ. RATE PER HOUR	MAINT. PER HOUR	OPERATOR PER HOUR	TOTAL PER HOUR
D9 DOZER CAT D9R	$20,000.00	$113.64	$43.30	$39.14	$196.08
D8 DOZER CAT D8R	$14,500.00	$82.39	$37.09	$39.14	$158.62
D6 DOZER CAT D6N	$8,100.00	$46.02	$18.69	$39.14	$103.85
7YD LOADER CAT 988F	$18,000.00	$102.27	$43.99	$39.14	$185.40
OFF-HIGHWAY TRUCK 769C	$12,000.00	$68.18	$31.63	$28.84	$128.65
20YD SCRAPER CAT 631E	$18,000.00	$102.27	$64.46	$39.14	$205.87
TRACTOR CASE 580K	$3,483.64	$19.79	$7.02	$39.14	$65.95
GRADER.CAT 14H	$10,000.00	$56.82	$21.45	$39.14	$117.41
3/4TON 4X4 PICKUP TRUCK	$658.09	$3.74	$5.69	$0.00	$9.43
P&H OMEGA 55 CRANE	$13,584.38	$77.18	$43.59	$40.34	$161.11
10 TON DUMP TRUCK	$3,399.11	$19.31	$19.03	$28.84	$67.18
3YD EXCAVATOR CAT 370	$12,700.00	$72.16	$44.79	$39.14	$156.09
TRACTOR DEERE 410C	$3,676.84	$20.89	$8.11	$39.14	$68.14
EIMCO 915 LHD	$6,795.93	$38.61	$26.68	$39.14	$104.43
CAT 370 EXCAVATOR WITH CRUSHER	$25,400.00	$144.32	$44.79	$39.14	$228.25

*MONTHLY RATES USED ON ALL EQUIPMENT DUE TO SIZE OF RECLAMATION PROJECT.

3. DEMOLITION AND REMOVAL COSTS (MEANS BUILDING CONSTRUCTION COST DATA 58TH EDITION)

JOB	LABEL	COST/UNIT
STEEL DISPOSAL - 2,000 TONS AND 25 TONS HAULED PER TRIP	STRIPS	$400.00 /TRIP
CONCRETE BREAKAGE MINESITE	CONM	$24.00 /YD3
CONCRETE BREAKAGE AND HAUL - LOADOUT	CONL	$39.79 /YD3
MIXED STEEL/CONC./WOOD	MIX	$0.23 /FT3
CONCRETE	CONC	$0.30 /FT3
STEEL	STEEL	$0.21 /FT3
PAVEMENT	PAVE	$3.91 /FT2
WATERLINES	WATER	$6.27 /FT
POWER		
POWERLINE (.33X1550)+705/5280	POWERLINE	$4.16 /FT
CHAIN LINK FENCE	FENCE	$1.54 /FT
GUARD RAIL REMOVAL	GUARD	$5.64 /FT
DISPOSAL ON SITE	SITE	$6.40 /YD3
DISPOSAL TO LANDFILL	FILL	$9.20 /YD3
STRAW MULCH	MULCH	$161.00 /TON
SEED MIX	SEED	$288.00 /ACRE
FERTILIZER	FERTILIZE	$236.00 /TON
HYDROMULCH&SACIFIER	TACK	$345.00 /ACRE
RIPRAP MATERIAL RANDOM - INSTALL	RIPRAP	$29.00 /YD3
RIPRAP MATERIAL +18" SIZE - INSTALLED	LARGERAP	$59.00 /YD3
FILTER MATERIAL - INSTALLED	FILTER	$29.00 /TON
AQUALIGHT	AQUALIGHT	$29.33 /YD3
AQUALIGHT PUMP	PUMP	$29.00 /HOUR
SILT FENCE - INSTALLED	SILT	$3.27 /FT
MULCHING - POWER MULCHER - INCLUDES HAY	MULCH	$1,001.88 /ACRE
MULCHING - HYDROMULCHING - INCLUDES MULCH	HYDROMLCH	$1,123.96 /ACRE
SEEDING - HYDROSEEDING	HYDROSEED	$1,066.46 /ACRE
- TRACTOR SPREADER	BROADCAST	$703.28 /ACRE
- PUSH SPTEADER	HANDSEED	$1,584.93 /ACRE
POLYPROPYLENE MESH - INSTALLED	MESH	$11,076.34 /ACRE
PLASTIC NETTING - INSTALLED	NET	$333.00 /ACRE
STEM PLANTINGS	STEM	$1.15 /STEM
WASTE DISPOSAL - 778.47 FT3 PER CONTAINER	WASTE	$196.00 /CONTAINER
CONCRETE - 8,000 PSI	CONCRETE	$160.00 /YD3

DETAILED COST ESTIMATE:

DESCRIPTION	MATERIALS	QUANTITY	/UNIT	COST	/UNIT	AMOUNT
I. DEMOLITION AND REMOVAL						
A. EQUIPMENT (NO SALVAGE VALUE ALLOWED ON EQUIPMENT) (CRUSHERS, BELT DRIVES, COUPLERS, ETC.)		1,525	TONS	$161.00	TONS	$245,525.00
B. STRUCTURES						
STEEL HAULED OF SITE	STRIP	80	TRIPS	$400.00	TRIPS	$32,000.00
SHOP-WAREHOUSE	MIX	1,969,000	FT3	$0.23	FT3	$452,870.00
SHOP-WAREHOUSE - WASTE	WASTE	505	CONTAINER	$196.00	CONTAINER	$98,980.00
ADMINISTRATION BUILDING	MIX	78,000	FT3	$0.23	FT3	$17,940.00
ADMINISTRATION BUILDING - WASTE	WASTE	20	CONTAINER	$196.00	CONTAINER	$3,920.00
MINE #1 TRANSFER TOWER	MIX	186,040	FT3	$0.23	FT3	$42,789.20
MINE #1 TRANSFER TOWER - WASTE	WASTE	48	CONTAINER	$196.00	CONTAINER	$9,408.00
MINE #2 DRIVE HOUSE	MIX	38,750	FT3	$0.30	FT3	$11,625.00
MINE #2 DRIVE HOUSE - WASTE	WASTE	10	CONTAINER	$196.00	CONTAINER	$1,960.00
MINE #2 & #3 DRIVE HOUSE	MIX	180,000	FT3	$0.23	FT3	$41,400.00
MINE #2 & #3 DRIVE HOUSE - WASTE	WASTE	46	CONTAINER	$196.00	CONTAINER	$9,016.00
CRUSHER - RAW COAL	MIX	88,000	FT3	$0.23	FT3	$20,240.00
CRUSHER - RAW COAL - WASTE	WASTE	23	CONTAINER	$196.00	CONTAINER	$4,508.00
TRUCK LOADOUT	MIX	30,000	FT3	$0.23	FT3	$6,900.00
TRUCK LOADOUT - WASTE	WASTE	8	CONTAINER	$196.00	CONTAINER	$1,568.00
RAILCAR LOADOUT	MIX	118,000	FT3	$0.23	FT3	$27,140.00
RAILCAR LOADOUT - WASTE	WASTE	30	CONTAINER	$196.00	CONTAINER	$5,880.00
CONVEYORS (8)	MIX	357,960	FT3	$0.23	FT3	$82,330.80
WATER TANKS (2)	STEEL	46,800	FT3	$0.21	FT3	$9,828.00
PUMP HOUSE	MIX	860	FT3	$0.23	FT3	$197.80
PUMP HOUSE - WASTE	WASTE	1	CONTAINER	$196.00	CONTAINER	$196.00
WELL HOUSE (3)	MIX	24,000	FT3	$0.23	FT3	$5,520.00
WELL HOUSE (3) - WASTE	WASTE	6	CONTAINER	$196.00	CONTAINER	$1,176.00
WATER TREATMENT BUILDING	MIX	90,000	FT3	$0.23	FT3	$20,700.00
WATER TREATMENT BUILDING	WASTE	23	CONTAINER	$196.00	CONTAINER	$4,508.00
MISC. STORAGE BUILDING	MIX	6,265	FT3	$0.23	FT3	$1,440.95
MISC. STORAGE BUILDING - WASTE	WASTE	2	CONTAINER	$196.00	CONTAINER	$392.00
OVERLAND CONVEYOR	MIX	480,000	FT3	$0.23	FT3	$110,400.00
OVERLAND CONVEYOR - WASTE	WASTE	123	CONTAINER	$196.00	CONTAINER	$24,108.00
GUARD RAIL	GUARD	1,500	FT.	$5.64	FT.	$8,460.00
ROCK DUST BUILDING	STEEL	15,504	FT3	$0.21	FT3	$3,255.84
OVERLAND DUST COLLECTOR	STEEL	4,800	FT3	$0.21	FT3	$1,008.00
SUBSTATION	STEEL	1,000	FT3	$0.21	FT3	$210.00
POWER LINES	POWERLINE	300	FT	$4.16	FT	$1,248.00
CAP MAGAZINE	STEEL	125	FT3	$0.21	FT3	$26.25
FUEL STORAGE FACILITIES	STEEL	140	FT3	$0.21	FT3	$29.40
PROPANE TANKS	STEEL	38	FT3	$0.21	FT3	$7.98
TRANSFORMER						$212.41
SWITCH GEAR						$212.41
JAMES CANYON WELLS						
- PULL PUMPS, JC-1,JC-2,7JC-3 (LANG EXPLORATION)						$75,000.00
- PLUG JC-1	CONCRETE	40	YD3	$160.00	YD3	$6,400.00
- PLUG JC-2	CONCRETE	81	YD3	$160.00	YD3	$12,960.00
- PLUG JC-3	CONCRETE	200	YD3	$160.00	YD3	$32,000.00
C. CONCRETE/PAVEMENT REMOVAL						
UPPER TERRACE AREA						
CONVEYOR FOUNDATION	CONM	47	YD3	$24.00	YD3	$1,130.67
STACK TUBE	CONM	237	YD3	$24.00	YD3	$5,697.78
RECLAIM TUNNEL	CONM	1,960	YD3	$24.00	YD3	$47,031.11
SLOPE PROTECTION APRON	CONM	753	YD3	$24.00	YD3	$18,080.00
ROCK DUST BUILDING	CONM	69	YD3	$24.00	YD3	$1,665.78
MIDDLE TERRACE AREA						
SHOP-WHSE FOUNDATION	CONM	190	YD3	$24.00	YD3	$4,560.00
#1 TRANSFER TOWER	CONM	66	YD3	$24.00	YD3	$1,584.00
CONVEYOR FOUNDATIONS	CONM	54	YD3	$24.00	YD3	$1,296.00
RAW COAL SILO	CONM	680	YD3	$24.00	YD3	$16,320.00
PARKING AREA	PAVE	1,260	YD3	$3.91	YD3	$4,926.60
CONCRETE LINED DITCH	CONM	21	YD3	$24.00	YD3	$506.67
FUEL STORAGE FACILITIES FOUNDATIONS	CONM	37	YD3	$24.00	YD3	$890.67
SUBSTATION FOUNDATIONS	CONM	74	YD3	$24.00	YD3	$1,785.78

LOWER TERRACE AREA							
CRUSHER FOUNDATION	CONM	108	YD3	$24.00	YD3		$2,592.00
#2 & #3 DRIVE HOUSE	CONM	136	YD3	$24.00	YD3		$3,253.33
CONVEYOR FOUNDATIONS	CONM	90	YD3	$24.00	YD3		$2,160.00
TRUCK LOADOUT FOUNDATION	CONM	10	YD3	$24.00	YD3		$240.00
ROAD AND PAD PAVEMENT	PAVE	14,670	FT2	$3.91	FT2		$57,359.70
MISC. STORAGE BUILDINGS	CONM	114	YD3	$24.00	YD3		$2,725.33
PROPANE TANK FOUNDATIONS	CONM	22	YD3	$24.00	YD3		$533.33
ACCESS ROAD AREA							
CONVEYOR FOUNDATIONS	CONM	1,200	YD3	$24.00	YD3		$28,800.00
RAIL LOADOUT AREA							
SILO WALLS	CONL	6,028	YD3	$39.79	YD3		$239,845.28
LOADOUT FOUNDATIONS	CONL	248	YD3	$39.79	YD3		$9,882.66
PAVING	PAVE	4,660	FT2	$3.91	FT2		$18,220.60
PUMP HOUSE	CONL	46	YD3	$39.79	YD3		$1,827.39
ON SITE DISPOSAL (CONC.)	SITE	5,869	YD3	$6.40	YD3		$37,561.60
OFF SITE DISPOSAL (PAVE)	FILL	6,795	YD3	$6.40	YD3		$43,488.00
SUBTOTAL DEMOLITION AND REMOVAL							$1,989,461.31

II. BACKFILLING AND GRADING

DESCRIPTION	EQUIPMENT	EQUIPEMT PRODUCTIVITY	UNITS	MATERIAL CALCULATION	UNITS	COST	UNIT		AMOUNT
A. PORTAL BACKFILLING (15)									
MINE #1 (4)**	EIMCO 915	79.15	YD3/HR	850	YD3/MINE PORTALS**				
BELT INCLINES(2)*				1,330	YD3/BELT INCLINES*				
MINES #3 (6)**				16,740	YD3				
SOUTH FORK (3)**				79.15	YD3/HR				
				211.50	HRS	$104.43	HR		$22,087.33
B. WATER TANK 0.26 ACRES	CAT D8R (1)			0	YD3/CUT				
	CAT 988F (1)			1,683	YD3/FILL				
	TRUCK 769C (3)	276.16	YD3/HR	276.16	YD3/HR				
				6.09	HRS	$729.97	HR	$4,448.68	
	PICKUP (1)			6.09	HRS	$9.43	HR	$57.46	
	FOREMAN (1)			6.09	HRS	$42.64	HR	$259.86	
									$4,766.00
C. MINE FACILITIES AREA									
LOWER TERRACE 11.4 ACRES	CAT D8R (2)			39,719	YD3/CUT				
	CAT 631E (3)	433.33	YD3/HR	103,352	YD3/FILL				
				1,300	YD3/HR				
				79.50	HRS	$934.85	HR	$74,322.66	
	PICKUP (1)			79.50	HRS	$9.43	HR	$749.64	
	FOREMAN (1)			79.50	HRS	$42.64	HR	$3,389.97	
									$78,462.27
MIDDLE BENCH 13.40 ACRES	CAT D8R (2)			159,200	YD3/CUT				
	CAT 631E (3)	433.33	YD3/HR	7,360	YD3/FILL				
				1,300	YD3/HR				
				122.46	HRS	$934.85	HR	$114,484.16	
	PICKUP (1)			122.46	HRS	$9.43	HR	$1,154.72	
	FOREMAN (1)			122.46	HRS	$42.64	HR	$5,221.80	
									$120,860.68
UPPER BENCH 13.40 ACRES									
WEST FORK	CAT D8R (2)			46,607	YD3/CUT				
	CAT 631E (3)	433.33	YD3/HR	48,744	YD3/FILL				
				1,300	YD3/HR				
				35.85	HRS	$934.85	HR	$33,516.10	
	PICKUP (1)			35.85	HRS	$9.43	HR	$338.05	
	FOREMAN (1)			35.85	HRS	$42.64	HR	$1,528.72	
									$35,382.87

SOUTHWEST FORK	CAT D8R (2)		15,667 YD3/CUT				
	CAT 631E (3)	433.33 YD3/HR	85,800 YD3/FILL				
			1,300 YD3/HR				
			66.00 HRS	$934.85	HR	$61,700.63	
	PICKUP (1)		66.00 HRS	$9.43	HR	$622.33	
	FOREMAN (1)		66.00 HRS	$42.64	HR	$2,814.26	
							$65,137.22
D. LOADOUT FACILITIES	CAT D8R (2)		96,149 YD3/CUT				
AREA 13.82 ACRES	CAT 631E (3)	433.33 YD3/HR	96,445 YD3/FILL				
			1,300 YD3/HR				
			74.19 HRS	$934.85	HR	$69,355.68	
	PICKUP (1)		74.19	$9.43	HR	$699.54	
	FOREMAN (1)		74.19	$42.64	HR	$3,163.42	
							$73,218.64
E. OVERLAND CONVEYOR .39 ACRES							
NO EARTHWORK PROPOSED							
F. WASTE ROCK DISPOSAL	CAT 345 (1)		2,132 YD3/FILL				
SITE 6.29 ACRES	12 T DUMP (3)	7.68 YD3/HR	23.04 YD3/HR				
EARTHWORK PROPOSED TO FILL	CAT 988F (1)		92.53 HRS	$543.04	HR	$50,250.17	
	PICKUP		92.53 HRS	$9.43	HR	$872.52	
	FOREMAN		92.53 HRS	$42.64	HR	$3,945.68	
							$55,068.37
G. SOUTH FORK PORTAL AREA	CAT 345(1)	350.78 YD3/HR	2,840 YD3/FILL				
.96 ACRES	12 T DUMP(2)	31.79 YD3/HR	710 YD3/CUT				
	CAT 988F (1)		2,130 YD3				
			63.58 YD3/HR				
			350.78 YD3/HR				
			8.10 HRS	$156.09	HR	$1,263.74	
			11.17 HRS	$319.77	HR	$3,570.87	
	PICKUP		19.26 HRS	$9.43	HR	$181.64	
	FOREMAN		19.26 HRS	$42.64	HR	$821.39	
							$5,837.63
H. JAMES CANYON AREA	CAT 345 (1)	350.78 YD3/HR	6,749.00 YD3/CUT				
3.35 ACRES			350.78 YD3/HR				
			19.24 HRS	$156.09	HR	$3,003.15	
	PICKUP		19.24 HRS	$9.43	HR	$181.42	
	FOREMAN		19.24 HRS	$42.64	HR	$820.39	
							$4,004.96
SUBTOTAL BACKFILLING AND GRADING							$464,825.98

III. TOPSOIL PREPARATION AND DISTRIBUTION

DESCRIPTION	EQUIPMENT	EQUIPMENT PRODUCTIVITY	UNITS	MATERIAL CALCULATION	UNITS	COST	UNIT		AMOUNT
A. WATER TANK 0.26 ACRES	CAT 769C (1)	92.03	YD3/HR	419	YD3				
1 FT. SOIL DEPTH	CAT 988F (1)			92.03	YD3/HR				
	CAT D8R (1)			4.56	HRS	$472.67	HR	$2,154.40	
	PICKUP (1)			4.56	HRS	$9.43	HR	$42.98	
	FOREMAN (1)			4.56	HRS	$42.64	HR	$194.35	
RIPPING	DEERE 410 (1)			0.26	ACRES				
	LABORER			1	ACRE/HR				
				0.26	HRS	$95.68	HR	$24.88	
									$2,416.61
LOWER TERRACE 11.4 ACRES	CAT 631E (5)	288.07	YD3/HR	16,940	YD3				
7.00 AC @ 1.5 FT. DEPTH	CAT D8R (1)			7,099	YD3				
4.4 AC @ 1 FT. DEPTH	PICKUP			24,039	YD3				
	FOREMAN			1,440	YD3/HR				
				16.69	HRS	$1,187.98	HR	$19,826.75	
	PICKUP			16.69	HRS	$9.43	HR	$157.37	
	FOREMAN			16.69	HRS	$42.64	HR	$711.64	
RIPPING	DEERE 410C (1)	1	ACRE/HR	11.40	ACRES				

	LABORER		11.4 HRS	$95.68	HR	$1,090.76	$21,786.52
MIDDLE BENCH 11.6 ACRES 6.36 AC @ 1.5 FT. DEPTH 5.24 AC @ 1 FT. DEPTH	CAT 631E (5) CAT D8R (1)	288.07 YD3/HR	15,391 YD3 8,454 YD3 23,845 YD3 1,440 YD3/HR				
			16.56 HRS	$1,187.98	HR	$19,667.07	
	PICKUP		16.56 HRS	$9.43	HR	$156.10	
	FOREMAN		16.56 HRS	$42.64	HR	$705.91	
	DEERE 410C (1)	1 ACRE/HR	11.6 ACRES				
	LABORER		11.6 HRS	$95.68	HR	$1,109.90	$21,638.98
UPPER BENCH 13.4 ACRES 6.67 AC @ 1.5 FT. DEPTH 6.73 AC @ 1 FT. DEPTH	CAT 631E (5) CAT D8R (1) PICKUP FOREMAN	288.07 YD3/HR	16,141 YD3 10,858 YD3 26,999 YD3 1,440 YD3/HR				
			18.74 HRS	$1,187.98	HR	$22,268.50	
	PICKUP		18.74 HRS	$9.43	HR	$176.75	
	FOREMAN		18.74 HRS	$42.64	HR	$799.28	
RIPPING							
	DEERE 410C (1)	1 ACRE/HR	13.4 ACRES				
	LABORER		13.4 HRS	$95.68	HR	$1,282.13	$24,526.65
C. LOADOUT FACILITIES 10.52 AC @ 1.5 FT. DEPTH 3.30 AC @ 1 FT. DEPTH	CAT 631E (3) CAT D8R (1) PICKUP FOREMAN	288.07 YD3/HR	25,458 YD3 5,324 YD3 30,782 YD3 864 YD3/HR				
			35.62 HRS	$776.23	HR	$27,648.79	
	PICKUP		35.62 HRS	$9.43	HR	$335.86	
	FOREMAN		35.62 HRS	$42.64	HR	$1,518.80	
RIPPING							
	DEERE 410C (1)	1 ACRE/HR	13.82 ACRES				
	LABORER		13.82 HRS	$95.68	HR	$1,322.31	$30,825.76
D. OVERLAND CONVEYOR 0.39 ACRES 0.39 AC @ 1 FT. DEPTH	DUMP (3) CAT 345 (1) CAT 988 F(1) PICKUP FOREMAN	31.79 YD3/HR	629 YD3 95 YD3/HR 6.60 HRS 6.60 HRS 6.60 HRS	$543.04 $9.43 $42.64	HR HR HR	$3,582.69 $62.21 $281.32	$3,926.22
E. WASTE ROCK DISPOSAL SITE 6.29 ACRES 6.29 AC @ 1 FT. DEPTH IMPORTED FROM MINESITE AREA.	DUMP (5) CAT 345 (1) CAT 988 F(1) PICKUP FOREMAN	31.79 YD3/HR	10,148 YD3 159 YD3/HR 63.84 HRS 63.84 HRS 63.84 HRS	$677.41 $9.43 $42.64	HR HR HR	$43,247.82 $601.99 $2,722.27	
RIPPING							
	DEERE 410C (1)	1 ACRE/HR	6.29 ACRES				
	LABORER		6.29 HRS	$95.68	HR	$601.83	$47,173.91
F. SOUTH FORK PORTAL AREA 0.3 AC @ 1.5 FT. DEPTH 0.66 AC @ 1 FT. DEPTH	CAT 988F (1) CAT D8R (1)	50 YD3/HR	726 YD3 1,065 YD3 1,791 YD3 50 YD3/HR				
			35.82 HRS	$344.02	HR	$12,321.39	
	PICKUP		35.82 HRS	$9.43	HR	$337.71	
	FOREMAN		35.82 HRS	$42.64	HR	$1,527.19	
RIPPING							
	DEERE 410C (1)	1 ACRE/HR	0.96 ACRES				
	LABORER		0.96 HRS	$95.68	HR	$91.85	$14,278.15
G. JAMES CANYON AREA 3.35 AC@ 2 IN. DEPTH	DUMP (1) CAT 345 (1) CAT 988 F(1)	20 YD3/HR 23 YD3/HR	100 YD3 858 YD3 20 YD3/HR				
			47.90 HRS	$408.67	HR	$19,575.53	
	PICKUP		47.90 HRS	$9.43	HR	$451.66	
	FOREMAN		47.90 HRS	$42.64	HR	$2,042.46	
SUBTOTAL TOPSOIL PREPARATION AND DISTRIBUTION							$22,069.64 $188,642.44

IV. STREAM CHANNEL RECLAMATION

DESCRIPTION	EQUIPMENT	EQUIPMENT PRODUCTIVITY	UNITS	MATERIAL CALCULATION	UNITS	COST	UNIT	AMOUNT
A. CULVERT BACKFILLING								
48" DIA. CULVERTS								
CULVERT CU-1				580	FT			
CULVERT CU-2				588	FT			
CULVERT CU-4				410	FT			
TOTAL LENGTH OF 48" DIA CULVERTS				1578	FT			
QUANTITY				0.43	YD3/FT			
QUANTITY FOR PROJECT				678.54	YD3	$75.00	YD3	$50,890.50
PRODUCTIVITY	PUMP (1)	30	YD3/HR					
	LABORER (3)			30	YD3/HR			
				22.62	HRS	$111.62	HR	$2,524.62
B. STREAM RECLAMATION								
STREAM A								
LENGTH				920	FT			
FILTER MATERIAL				1.29	YD3/FT			
RIPRAP MATERIAL				1.46	YD3/FT			
(INSTALLED COST)	FILTER			1,911.00	TON	$29.00	TON	$55,419.00
	RIPRAP			1,343.20	YD3	$29.00	YD3	$38,952.80
STREAM B								
LENGTH				875	FT			
FILTER MATERIAL				1.29	YD3/FT			
RIPRAP MATERIAL				1.46	YD3/FT			
(INSTALLED COST)	FILTER			1,928.00	TON	$29.00	TON	$55,912.00
	RIPRAP			1,277.50	YD3	$29.00	YD3	$37,047.50

STREAM C						
LENGTH		1060	FT			
FILTER MATERIAL		1.29	YD3/FT			
RIPRAP MATERIAL		1.46	YD3/FT			
(INSTALLED COST)	FILTER	2,216.00	TON	$29.00	TON	$64,264.00
	RIPRAP	1,547.60	YD3	$29.00	YD3	$44,880.40
STREAM D						
LENGTH		190	FT			
FILTER MATERIAL		4.32	YD3/FT			
RIPRAP MATERIAL		1.86	YD3/FT			
(INSTALLED COST)	FILTER	1,330.00	TON	$29.00	TON	$38,570.00
	RIPRAP	353.40	YD3	$29.00	YD3	$10,248.60
STREAM E						
LENGTH		1000	FT			
FILTER MATERIAL		3.00	YD3/FT			
RIPRAP MATERIAL		1.33	YD3/FT			
(INSTALLED COST)	FILTER	4,860.00	TON	$29.00	TON	$140,940.00
	RIPRAP	1,330.00	YD3	$29.00	YD3	$38,570.00
ARCH CULVERT INSTALLATION CD-17						
FILTER BLANKET	FILTER	386	TON	$29.00	TON	$11,194.00
RIPRAP	RIPRAP	48	YD3	$29.00	YD3	$1,392.00
CONCRETE	CONCRETE	15	YD3	$350.00	YD3	$5,250.00
LINER PLATE		160	FT	$30.00	FT	$4,800.00
SUBTOTAL STREAM CHANNEL RECLAMATION						$600,855.42

V. REVEGETATION

TOTAL AREA TO BE REVEGETATED 59.11 ACRES

DESCRIPTION	EQUIPMENT	MATERIAL CALCULATION	UNIT	COST	UNIT	AMOUNT
LOADOUT AREA	HYDROSEED	13.82	ACRES	$1,066.46	ACRE	$14,738.48
	HYROMULCH	13.82	ACRES	$1,123.96	ACRE	$15,533.13
PORTAL YARD	HYDROSEED	36.40	ACRES	$1,066.46	ACRE	$38,819.14
	HYDROMULCH	36.40	ACRES	$1,123.96	ACRE	$40,912.14
WATER TANK &	HYDROSEED	0.26	ACRES	$1,066.46	ACRE	$277.28
	HYDROMULCH	0.26	ACRES	$1,123.96	ACRE	$292.23
CONVEYOR ROUTE	HYDROSEED	0.39	ACRES	$1,066.46	ACRE	$415.92
	HYDROMULCH	0.39	ACRES	$1,123.96	ACRE	$438.34
WASTE ROCK DISPOSAL SITE	HYDROSEED	6.29	ACRES	$1,066.46	ACRE	$6,708.03
	HYDROMULCH	6.29	ACRES	$1,123.96	ACRE	$7,069.71
SOUTH FORK BREAKOUT	HYDROSEED	0.96	ACRES	$1,066.46	ACRE	$1,023.80
	HYDROMULCH	1	ACRES	$1,123.96	ACRE	$1,079.00
JAMES CANYON AREA	RESEED	3.35	ACRES	$1,584.93	ACRE	$5,309.52
	MULCH	3.35	ACRES	$1,001.88	ACRE	$3,356.30

RIPARIAN STEM SUPPLEMENT (NOTE: RIPARIAN STEM SUPPLEMENT ACRES ARE ALSO INCLUDED IN ABOVE)			3.50 ACRES 2,800 STEMS/ACRE 9,800 STEMS		$1.15	STEM		$11,270.00 $147,243.02
VEGETATIVE MAINTENANCE								$147,243.02
SUBTOTAL REVEGETATION								$294,486.05

VI. INTERIM SEDIMENT CONTROL FACILITIES

DESCRIPTION	EQUIPMENT	EQUIPMENT PRODUCTIVITY	UNITS	MATERIAL CALCULATION	UNIT	COST	UNIT		AMOUNT
A. SILT FENCE (ALL AREAS)	SILT			20,000	FT	$3.27	FT		$65,400.00
B. LOADOUT FACILITIES SEDIMENT POND ENLARGEMENT FOR RECLAMATION	CAT 988F	220	YD3/HR	950 220 4.32	YD3 YD3/HR HRS	$185.40	HR	$800.60	
	FOREMAN			4.32	HRS	$9.43	HR	$40.72	
	PICKUP			4.32	HRS	$42.64	HR	$184.13	
C. LOADOUT DIVERSION TO SEDIMENT POND	CAT 14G			1.00	HR	$117.41	HR	$117.41	
	FOREMAN			1.00	HR	$9.43	HR	$9.43	
	PICKUP			1.00	HR	$42.64	HR	$42.64	
DIVERSION DU 2									$1,194.92
D. LOADOUT SEDIMENT POND REMOVAL - PHASE II									
BACKFILL POND W/EMBANKMENT MATERIAL	CAT 988F	220	YD3/HR	1,500 220 6.82	YD3 YD3/HR HRS	$185.40	HR	$1,264.11	
	FOREMAN			6.82	HRS	$9.43	HR	$64.29	
	PICKUP			6.82	HRS	$42.64	HR	$290.73	
									$1,619.13
TOPSOIL PLACEMENT 1 FT. DEPTH	CAT 988F	220	YD3/HR	0.3 484 220 2.20	ACRES YD3 YD3/HR HRS	$185.40	HR	$407.89	
	FOREMAN			2.20	HRS	$9.43	HR	$20.74	
	PICKUP			2.20	HRS	$42.64	HR	$93.81	
									$522.44
REVEGETATION	HYDROSEED			0.3 0.3	ACRE ACRE	$1,066.46 $1,123.96	ACRE ACRE		$319.94 $337.19
VEGETATIVE MAINTENANCE									
DIVERSION REMOVAL DU 2	CAT 988F			1.00	HR	$185.40	HR	$185.40	
	FOREMAN			1.00	HR	$9.43	HR	$9.43	
	PICKUP			1.00	HR	$42.64	HR	$42.64	
									$237.47
SUBTOTAL INTERIM SEDIMENT CONTROL FACILITIES									$69,631.09

MASS BALANCE EARTHWORK

LOCATION	CUT	FILL
PORTAL BACKFILLING	0	0
MINE FACILITIES		
LOWER BENCH	52,889	234,896
MIDDLE BENCH	176,477	40,085
UPPER BENCH	123,814	97,608
WATER TANK	0	1,683
LOADOUT FACILITIES	96,149	96,445
OVERLAND CONVEYOR	0	0
WASTE DISPOSAL SITE	0	2,132
SOUTH FORK SITE	2,840	2,840
JAMES CANYON	6,749	6,239
TOTAL	458,918	481,928

TOPSOIL MASS BALANCE

TOPSOIL MATERIAL AVAILABLE	
MINE FACILITIES	91,586
LOADOUT FACILITIES	27,690
SOUTH FORK SITE	2,990
JAMES CANYON	958
TOTALS	123,224
MINE FACILITIES	
LOWER BENCH	(24,039)
MIDDLE BENCH	(23,845)
UPPER BENCH	(26,999)
WATER TANK	(419)
LOADOUT FACILITIES	(30,782)
OVERLAND CONVEYOR	(629)
WASTE DISPOSAL SITE	(10,148)
SOUTH FORK SITE	(2,275)
JAMES CANYON	(958)
TOTALS	(120,094)
BALANCE	3,130

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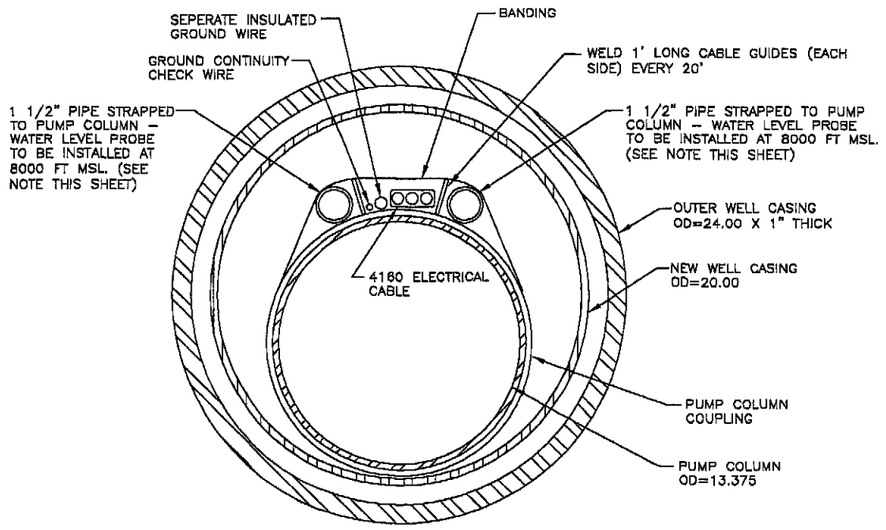
DIV. OF OIL, GAS & MINING

REVISIONS	
DATE	BY

JAMES CANYON WELL JC-3
PUMP AND PIPING DETAILS

Canyon Fuel Company, LLC
Skyline Mines

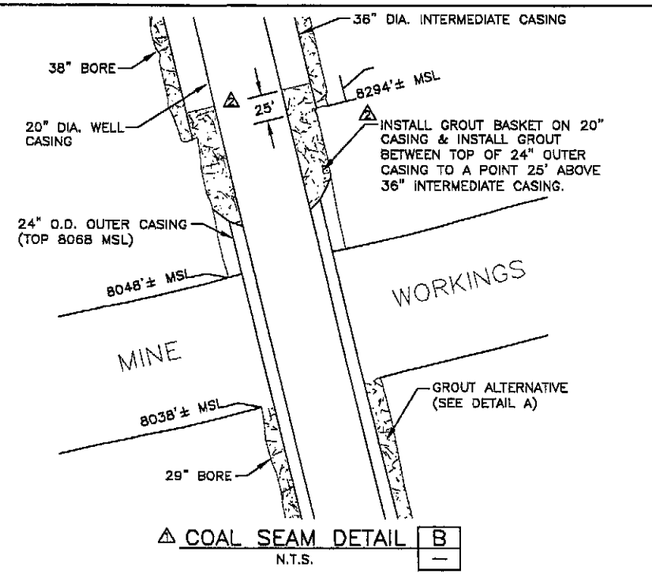
P.O. BOX 719 HELPER, UTAH 84526 435-448-6463	DATE: 3-31-03	CK.BY:	REVISION:
P:permits\...\JC-3\plate3-2-11-a	SCALE: NA	DR.BY:	
DWG. NO.:	PLATE#: 3.2.11-A		



SECTION 3
N.T.S.

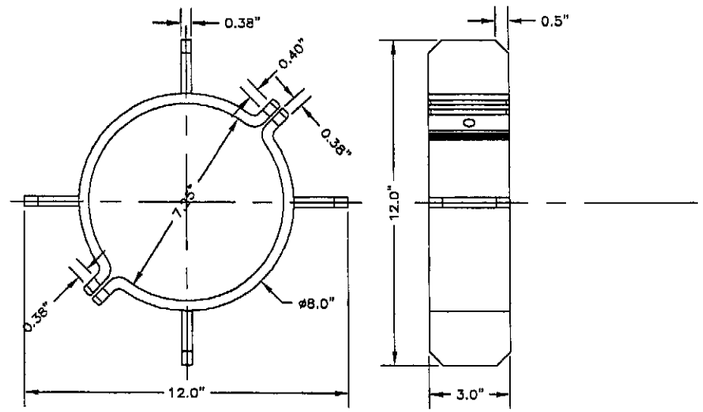
NOTE:

DUAL 1 1/2" PIPES ARE TO BE USED FOR INSTALLATION OF REDUNDANT WATER LEVEL TRANSDUCERS PER MSHA REQUIREMENTS. ONE PROBE WILL FUNCTION IN PRIMARY MODE, THE OTHER IN REDUNDANT BACKUP MODE. DRUCK MODEL 1830, 4–20mA DC, 0–100 psig.

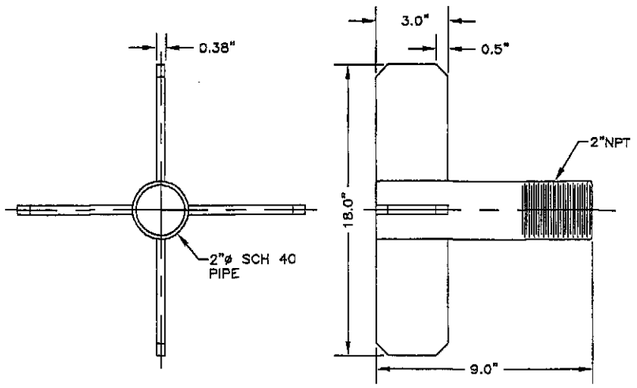


COAL SEAM DETAIL B
N.T.S.

MOTOR CENTRALIZER



BOTTOM CENTRALIZER

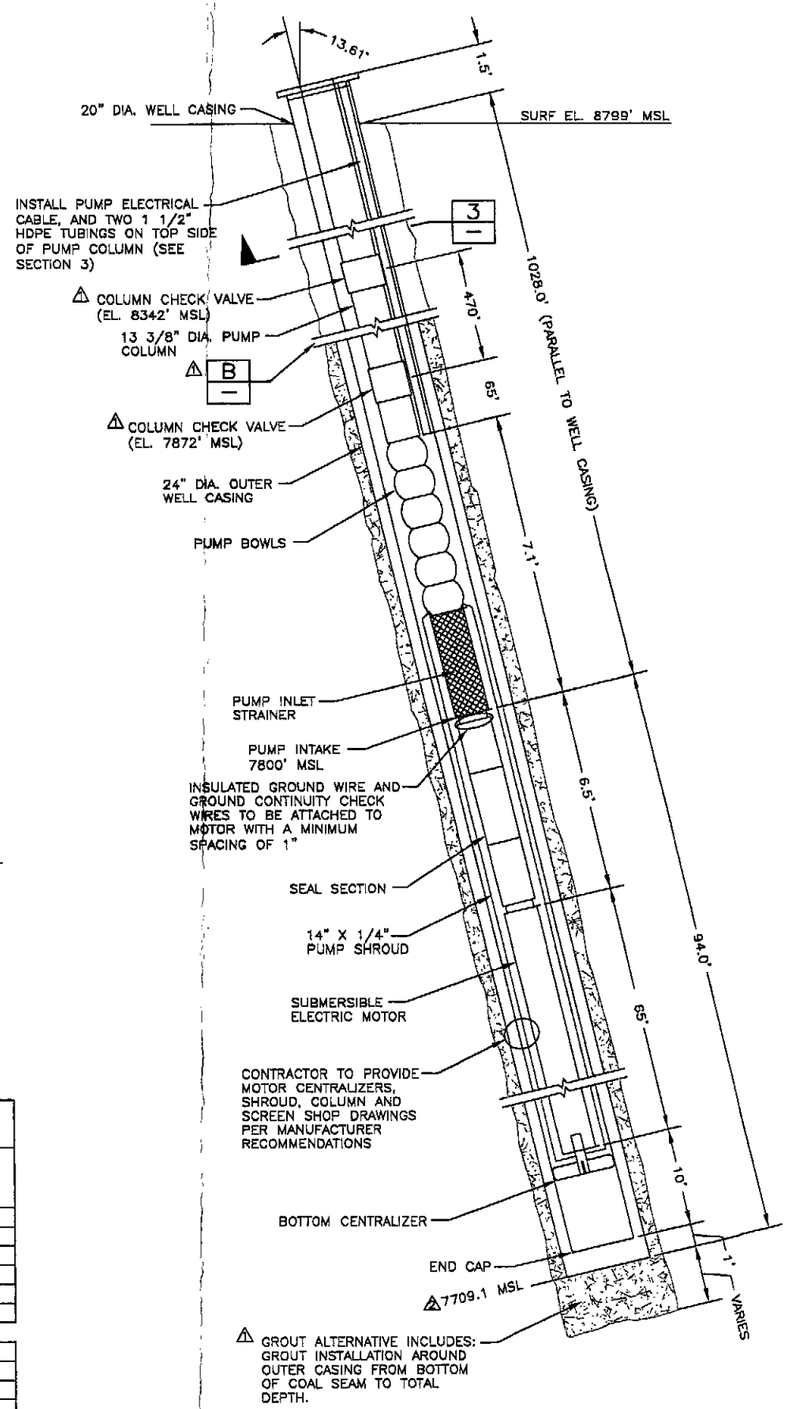


CASING SCHEDULE

EL. (MSL)	ANGLE LENGTH (FT)	CASING
8068–8054.3	14.1	24" OD X 1" THICK STEEL – BLANK *
8054.3–8030	25	24" OD X 1" THICK STEEL – (8) 1/2" X 3 1/2" SLOTS/FT
8030–7730.5	308.2	24" OD X 1" THICK STEEL – BLANK
7730.5–7711.1	20	24" OD X 1" THICK STEEL – (4) 1/2" X 3 1/2" SLOTS/FT
7711.1–7709.1	2	24" OD X 1" THICK STEEL – BLANK
TOTAL	369.3'	

8799–8061.7	758.7	20" OD STEEL CASING – BLANK
8061.7–8018	45	20" OD –125 SLOT – 304 SS WIRE WRAP SCREEN
8018–7730.5	295.8	20" OD STEEL CASING – BLANK
7730.5–7711.1	20	20" OD –125 SLOT – 304 SS WIRE WRAP SCREEN
7711.1–7710.1	1	20" OD STEEL CASING – BLANK
TOTAL	1120.5'	

* CONTRACTOR TO PROVIDE SHOP DRAWINGS SHOWING DETAILS OF GROUT SEAL TERMINATING OUTER CASING.



WELL PUMP DETAIL A
N.T.S.

FILE NAME: 005\13-130\CADFILES\JAMES CANYON WELL NO. 3_REV_3.DWG
FILE DATE: 3.28.2003 16:43:40 (DRB)

HANSEN ALLEN & LUCE, Inc. ENGINEERS

REGISTERED PROFESSIONAL ENGINEER #171580 DAVID E. HANSEN STATE OF UTAH

PROJECT ENGINEER

DESIGNED	MPW	3/28/2003	ADDITION OF GROUT ABOVE COAL SEAM
DRAFTED	MPW	3/24/2003	REVISED PER BLM REQUEST
CHECKED	DEH	0	RELEASE FOR CONSTRUCTION
DATE	FEBRUARY 2003	NO.	DATE

REVISIONS — BY — APVD.

SCALE: NOT TO SCALE

VERIFY SCALE: 0" 1" BAR IS ONE INCH ON ORIGINAL DRAWING. IF NOT ONE INCH ON THIS SHEET ADJUST SCALES ACCORDINGLY.

PACIFICORP

JAMES CANYON WELL JC–3
PUMP AND PIPING
WELL DETAILS

SHEET NO. C–3 OF 4

005.13.130

6/01